



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,733	09/29/2003	Amiram Hayardeny	IL920030031US1	1932

7590 10/06/2006
Stephen C. Kaufman
Intellectual Property Law Dept.
IBM Corporation
P.O. Box 218
Yorktown Heights, NY 10598

EXAMINER

KIM, PAUL

ART UNIT PAPER NUMBER

2161

DATE MAILED: 10/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/673,733

Applicant(s)

HAYARDENY ET AL.

Examiner

Paul Kim

Art Unit

2161

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


SAM RIMELL
PRIMARY EXAMINER

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/17/2005.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This Office action is responsive to the following communication: Continuation-in-part application filed on 29 September 2003.
2. Claims 1-60 are pending and present for examination. Claims 1, 21 and 41 are independent.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 17 March 2005 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or

Art Unit: 2161

claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1, 4, 6-9, 12-13, 17, 24, 26-29, 32-33, 41, 44, 46-49, 52-53 and 57 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-6, 10, 14, 17-22, 26, 30, 33-38, 43 and 46 of copending Application No. 10/673,529. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter. Additionally, it would have been obvious to one of ordinary skill in the art at the time the inventions were claimed to take into account for the minor differences in the claimed invention wherein a method allows for the record to be updated or modified on the second storage subsystem instead of the primary storage subsystem.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. **Claims 5, 25 and 45** are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The sub-method of making the determination of whether "the specified location is not included in the record" is critical or essential to the practice of the invention, but not

Art Unit: 2161

included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). That is, it is necessary to include the step of making such a determination since the record is maintained on the secondary storage subsystem while the data to be written to a specified location is received at the primary storage subsystem. Therefore, the present claimed invention would not be able to sufficiently make a determination of whether "the specified location is not included in the record" without making a request to the record of the second storage subsystem for information pertinent to the data.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. **Claims 1-3, 6, 8** are rejected under 35 U.S.C. 102(b) as being anticipated by Cannon et al (U.S. Patent No. 6,148,412, hereinafter referred to as CANNON), filed on 3 September 1997, and issued on 14 November 2000.

10. **As per independent claims 1, 21 and 41**, CANNON teaches:

A method for managing a data storage system that includes primary and secondary storage subsystems, including respective first and second non-volatile storage media, the method comprising:

maintaining a record on the secondary storage subsystem, which is predictive of locations to which data are to be written on the primary storage subsystem by a host processor {See CANNON, C11:L63-67, wherein this reads over "step 660 queries the server database 60 to build a list of the files stored on the selected copy storage volume"};

receiving at the primary storage subsystem, from the host processor, the data to be written to a specified location on the first non-volatile storage media {See CANNON, C10:L1-16, wherein this reads over "[t]he client files that are not located within the copy storage pool, where no matched entry is found in the database, are added to the list" and "the current entry in the file list is checked to determine if it represents a new file"};

if the specified location is not included in the record, sending a message from the primary storage subsystem to the secondary storage subsystem so as to cause

Art Unit: 2161

the secondary storage subsystem to update the record {See CANNON, C12:L17-22, wherein this reads over "[t]he server database 60 is updated to reflect the new location of the primary copy of the file, the new time stamp, the file status, and the back-up copies in the copy storage pools pertaining to this new primary copy are no cross-referenced to the new primary storage location"};

signaling the host processor that the data have been stored in the data storage system responsively to receiving the data and, if the specified location was not included in the record, responsively to receiving an acknowledgment at the primary storage subsystem from the secondary storage subsystem indicating that the record has been updated {See CANNON, C8:L42-57, wherein this reads over "the server signals transfer complete to the requesting client system once the primary copy of the client file is stored in a primary storage pool"; C12:L23-30, wherein this reads over "step 699 signals that the recovery has been completed, the damaged files on the primary storage volumes 41-45 have been recovered from the back-up files on the copy storage volumes 51-54"; and C12:L17-22, wherein this reads over "[t]he server database 60 is updated to reflect the new location of the primary copy of the file, the new time stamp, the file status, and the back-up copies in the copy storage pools pertaining to this new primary copy are no cross-referenced to the new primary storage location"}; and

storing the data in the specified location on both the first and second non-volatile storage media {See CANNON, C12:L6-22, wherein this reads over "[t]his method 600 copies only those back-up files that are paired with a damaged file or a file located on a destroyed primary storage volume. At step 680, the back-up file on the copy storage volume is copied to a primary storage volume"}.

11. As per dependent claims 2, 22 and 42, CANNON teaches:

The method according to claim 1, wherein sending the message comprises copying the data synchronously from the primary storage subsystem to the secondary storage subsystem {See CANNON, C8:L42-51, wherein this reads over "synchronous back-up generation"}.

12. As per dependent claims 3, 23 and 43, CANNON teaches:

The method according to claim 2, wherein storing the data comprises, if the specified location is included in the record, copying the data from the primary storage subsystem to the secondary storage subsystem asynchronously {See CANNON, C8:L51-57, wherein this reads over "asynchronous back-up copying"}, without updating the record with respect to the specified location {See CANNON, C8:L39-41, wherein this reads over "the inventory and reference list entries within the server database for the back-up copies need not be updated"}.

13. As per dependent claims 6, 26 and 46, CANNON teaches:

The method according to claim 1, wherein copying the data comprises creating a mirror on the secondary storage subsystem of the data received by the primary storage subsystem {See CANNON, C2:L4-7, wherein this reads over "[t]he primary and secondary storage devices again form duplex pairs with the secondary storage device mirroring the primary storage device"}.

14. As per dependent claims 8, 28 and 48, CANNON teaches:

The method according to claim 6, and comprising, upon recovery of the system from a failure of the primary storage subsystem, conveying, responsively to the record, a portion of the data from the secondary storage subsystem to the primary storage subsystem for storage on the primary storage subsystem {See CANNON, C12:L6-22,

Art Unit: 2161

wherein this reads over "[t]his method 600 copies only those back-up files that are paired with a damaged file or a file located on a destroyed primary storage volume. At step 680, the back-up file on the copy storage volume is copied to a primary storage volume").

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. **Claims 4, 24 and 44** rejected under 35 U.S.C. 103(a) as being unpatentable over CANNON, in view of Micka et al (U.S. Patent No. 5,657,440, hereinafter referred to as MICKA), filed on 28 June 1996, and issued on 12 August 1997.

17. **As per dependent claims 4, 24 and 44**, CANNON, in combination with MICKA, discloses:

The method according to claim 3, wherein copying the data comprises transmitting the data between mutually-remote sites {See CANNON, Figures 1 and 3-4} over a communication link between the sites {See MICKA, C2:L43-50, wherein this reads over "each primary subsystem has a direct independent link to a selected secondary subsystem"}.

The combination of inventions disclosed in CANNON and MICKA would disclose an invention which further comprised of direct links between the subsystems. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above invention suggested by CANNON by combining it with the invention disclosed by MICKA.

One of ordinary skill in the art would have been motivated to do this modification so that the data may be transmitted over a direct link between the subsystems.

18. **Claim 7, 10-11, 27, 30-31, 47 and 50-51** rejected under 35 U.S.C. 103(a) as being unpatentable over CANNON, in view of Kawamura et al (USPGPUB 2004/0193658, hereinafter referred to as KAWAMURA), filed on 29 August 2003, and published on 30 September 2004.

19. **As per dependent claims 7, 27 and 47**, CANNON, in combination with KAWAMURA, discloses:

Art Unit: 2161

The method according to claim 6, and comprising, upon occurrence of a failure in the primary storage subsystem, configuring the secondary storage subsystem to serve as the primary storage subsystem so as to receive further data from the host processor to be stored by the data storage system {See KAWAMURA, [0025], wherein this reads over "[i]n a system in which switching to a second database processing system is conducted when a failure has occurred in a first database processing system"}.

The combination of inventions disclosed in CANNON and KAWAMURA would disclose an invention which switched to a secondary storage subsystem upon the failure of the primary storage subsystem. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above invention suggested by CANNON by combining it with the invention disclosed by KAWAMURA.

One of ordinary skill in the art would have been motivated to do this modification so that upon the failure of the primary storage subsystem, the secondary storage subsystem may receive further data such that data storage would not be halted. In addition, CANNON and KAWAMURA are analogous art because they belong to the same field of endeavor, such as, back up and mirroring data between a plurality of storage devices, memory allocation, and database management systems.

20. **As per dependent claims 10, 30 and 50**, CANNON, in combination with KAWAMURA, discloses:

The method according to claim 1, wherein maintaining the record comprises maintaining a copy of the record on the primary storage subsystem, and wherein sending the message comprises deciding at the primary storage subsystem to send the message responsively to the copy of the record {See KAWAMURA, [0030], wherein this reads over "[t]he secondary storage subsystem receives a write request of the log information, database data, or status information from the primary storage subsystem"}.

The combination of inventions disclosed in CANNON and KAWAMURA would disclose an invention wherein the primary storage subsystem would decide to send the message in response to the copy of the record and further maintain the copy of the record. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above invention suggested by CANNON by combining it with the invention disclosed by KAWAMURA.

One of ordinary skill in the art would have been motivated to do this modification so that upon the failure of the either storage subsystem, one of the said storage subsystems would have stored and

Art Unit: 2161

maintained the record. In addition, CANNON and KAWAMURA are analogous art because they belong to the same field of endeavor, such as, back up and mirroring data between a plurality of storage devices, memory allocation, and database management systems.

21. **As per dependent claims 11, 31 and 51**, CANNON, in combination with KAWAMURA, discloses:

The method according to claim 10, wherein sending the message comprises modifying both the record and the copy of the record responsively to the specified location (See KAWAMURA, [0028], wherein this reads over "[t]he primary storage subsystem receives the write request from the host computer. According to contents of the received write request, modification of log information, data in the database area, and status information in the primary storage subsystem is conducted").

The combination of inventions disclosed in CANNON and KAWAMURA would disclose an invention which modified both the record and the copy of the record with the specified location. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above invention suggested by CANNON by combining it with the invention disclosed by KAWAMURA.

One of ordinary skill in the art would have been motivated to do this modification so that both the record and the copy of the record would maintain updated locations. In addition, CANNON and KAWAMURA are analogous art because they belong to the same field of endeavor, such as, back up and mirroring data between a plurality of storage devices, memory allocation, and database management systems.

22. **Claims 9, 29 and 49** are rejected under 35 U.S.C. 103(a) as being unpatentable over CANNON, in view of Kern et al (U.S. Patent No. 5,720,029, hereinafter referred to as KERN), filed on 25 July 1995, and issued on 17 February 1998.

23. **As per dependent claim 9, 29 and 49**, CANNON, in combination with KERN, discloses:

The method according to claim 1, wherein maintaining and updating the record comprise marking respective bits in a bitmap corresponding to the locations to which the data are to be written on the first and second non-volatile storage media (See KERN, Figure 4; and C9:L46-58, wherein this reads over "a pair of track arrays 410, 411, or bit maps, is shown for each several data storage devices numbered from 1 to N").

Art Unit: 2161

The combination of inventions disclosed in CANNON and KERN would disclose an invention which, in maintaining and updating the record, used bits in a bitmap corresponding to the locations to which the data are to be written. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above invention suggested by CANNON by combining it with the invention disclosed by KERN.

One of ordinary skill in the art would have been motivated to do this modification so that the bitmaps may be used to mark certain locations of the first and second non-volatile storage media to which data is to be written. In addition, CANNON and KAWAMURA are analogous art because they belong to the same field of endeavor, such as, maintaining copies of data and records on both a primary and secondary site.

24. **Claims 12, 32 and 52** are rejected under 35 U.S.C. 103(a) as being unpatentable over CANNON, in view of KAWAMURA, and in further view of Black (U.S. Patent No. 6,978,324, hereinafter referred to as BLACK, filed on 27 June 2000, and issued on 20 December 2005).

25. **As per dependent claims 12, 32 and 52**, CANNON, in combination with KAWAMURA and BLACK, discloses:

The method according to claim 11, wherein modifying both the record and the copy of the record comprises adding a plurality of locations, including the specified location, to both the record and the copy of the record {See BLACK, C25:L60-64, wherein this reads over "the host mapping table may be updated at a step 254. In the example of FIG. 15B, this would correspond to adding an entry in the table"}.

The combination of inventions disclosed in CANNON, KAWAMURA and BLACK would disclose an invention which added a plurality of locations to both the record and the copy of the record. That is "the host mapping table" may be updated by the addition of new entries which specified locations of the data. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above invention suggested by CANNON by combining it with the invention disclosed by KAWAMURA and BLACK.

One of ordinary skill in the art would have been motivated to do this modification so that the record may be continually updated with new entries which specified the locations of data.

Art Unit: 2161

26. **Claims 13-14, 33-34 and 53-54** are rejected under 35 U.S.C. 103(a) as being unpatentable over CANNON, in view of KAWAMURA, and in further view of Dunham (U.S. Patent No. 6,269,431, hereinafter referred to as DUNAHM), filed on 13 August 1998, and issued on 31 July 2001.

27. **As per dependent claims 13, 33 and 53**, CANNON, in combination with KAWAMURA and DUNHAM, discloses:

The method according to claim 10, wherein maintaining the copy of the record comprises selecting one or more locations, other than the specified location, to be removed from the record, and instructing the secondary storage subsystem to remove the one or more locations from the record, so as to limit a size of the record {See DUNHAM, C17:L67-C18:L4, wherein this reads over "[u]pon completion of a file deletion command, the secondary data storage subsystem would return an acknowledgment to the host, and the host could update its catalog to reflect deletion of the files from the back-up version of the file system"}.

The combination of inventions disclosed in CANNON, KAWAMURA and DUNHAM would disclose an invention which removed one or more locations from the record. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above invention suggested by CANNON by combining it with the invention disclosed by KAWAMURA and DUNHAM.

One of ordinary skill in the art would have been motivated to do this modification so that the size of the record may be limited by archiving and purging unnecessary entries from the record. In addition, CANNON and DUNHAM are analogous art because they belong to the same field of endeavor, such as, back up and mirroring data between a plurality of storage devices, memory allocation, and database management systems.

28. **As per dependent claims 14, 34 and 54**, CANNON, in combination with KAWAMURA and DUNHAM, discloses:

The method according to claim 13, wherein storing the data comprises copying the data to be stored in the one or more locations from the primary storage subsystem to the secondary storage subsystem {See KAWAMURA, [0072], wherein this reads over "the primary disk subsystem 2 writes the log block 262 a transmitted together with the write request into the cache 22, transmits the log block 262a to the secondary disk subsystem 4, requests remote copy of the log block 262a in the secondary disk subsystem 4, and waits for completion of the remote copy"}, and

wherein selecting the one or more locations comprises receiving a return message from the secondary storage subsystem indicating that the secondary storage

Art Unit: 2161

subsystem has received the copied data {See KAWAMURA, [0073], wherein this reads over "the secondary disk subsystem 4 writes the log block 262a transmitted together with the write request into the cache 22, and thereafter generates a remote copy completion notice indicating that the writing has been completed, and transmits the remote copy completion notice to the primary disk subsystem 2"}, and

selecting the one or more locations to be removed from the record responsively to the return message {See DUNHAM, C17:L38-C18-24, wherein this reads over "[t]he procedure, for example, deletes files of the file system that have expired or that a user or application program did not request to be backed up" and "the back-end data mover updates the secondary directory to refer to the new, compacted file system and thereby delete the original backup version of the file system"}.

The combination of inventions disclosed in CANNON, KAWAMURA and DUNHAM would disclose an invention which selected one or more locations from the record for removal. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above invention suggested by CANNON by combining it with the invention disclosed by KAWAMURA and DUNHAM.

One of ordinary skill in the art would have been motivated to do this modification so that the size of the record may be limited by archiving and purging selected entries from the record. In addition, CANNON and DUNHAM are analogous art because they belong to the same field of endeavor, such as, back up and mirroring data between a plurality of storage devices, memory allocation, and database management systems.

29. **Claims 15-17, 35-37 and 55-57** are rejected under 35 U.S.C. 103(a) as being unpatentable over CANNON, in view of KAWAMURA and DUNHAM, and in further view of Official Notice.

30. **As per dependent claims 15, 35 and 55**, it would have been obvious to one of ordinary skill in the art at the time the invention was made to identify locations containing identical data since multiple copies of identical data need not be stored in multiple locations. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to remove the location which was least-recently added so that the least-current location containing the identical data may be discarded.

31. **As per dependent claims 16, 36 and 56**, it would have been obvious to one of ordinary skill in the art at the time the invention was made to group the entries added to the copy of the record and

Art Unit: 2161

the record in generations so that the generations, or versions, of entries may be used in discarding entries of a certain generation or version using a batch method.

32. **As per dependent claim 17, 37 and 57**, it would have been obvious to one of ordinary skill in the art at the time the invention was made to append an instruction to the message sent from the primary storage subsystem to the secondary storage subsystem, so that the appended instruction may be used in providing the secondary storage subsystem with the instructions to remove the locations.

33. **Claims 18-20, 38-40 and 58-60** are rejected under 35 U.S.C. 103(a) as being unpatentable over CANNON, in view of BLACK.

34. **As per dependent claims 18, 38 and 58**, CANNON, in combination with BLACK, discloses:

The method according to claim 1, wherein sending the message causes the secondary storage subsystem to predict one or more further locations to which the host processor is expected to write the data in a subsequent write operation {See BLACK, C25:L45-50, wherein this reads over "it is determined whether the location of the specified ELVID (plus logical unit number) is known, at a step 151"}, and to add the one or more further locations to the record {See BLACK, C25:L60-64, wherein this reads over "the host mapping table may be updated at a step 254. In the example of FIG. 15B, this would correspond to adding an entry in the table"}.

The combination of inventions disclosed in CANNON and BLACK would disclose an invention which predicted the location to which the data is expected to be written. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above invention suggested by CANNON by combining it with the invention disclosed by KAWAMURA and DUNHAM.

One of ordinary skill in the art would have been motivated to do this modification so that the record may be updated and modified prior to the actual data having been written to the location.

35. **As per dependent claims 19, 39 and 59**, CANNON, in combination with BLACK, discloses:

The method according to claim 18, wherein the one or more further locations comprise a predetermined number of consecutive locations in proximity to the specified location {See BLACK, C25, L10-19, wherein this reads over "(Under other embodiments, however, an ELVID may specify a group of logical entities, with another field specifying a subunit of the identified logical entity ...")}.

36. **As per dependent claims 20, 40 and 60**, CANNON, in combination with BLACK, discloses:

Art Unit: 2161

The method according to claim 18, wherein maintaining the record comprises recording the locations to which the data are written using an object-based storage technique {See BLACK, C24:L11-18, wherein this reads over "the enterprise storage management console 124 retains a database tracking logical entities that have been assigned ELVIDs in the storage domain 121"}, and

wherein the one or more further locations are chosen based on a logical connection between storage objects {See BLACK, C25:L53-57, wherein this reads over "[t]his step may be performed by accessing a centralized database that includes location of the ELVIDs, such as a database stored at the enterprise storage management console 124 of FIG. 14. In other embodiments, so or all of the physical storage elements in the storage domain may be polled to determine whether they have the appropriate logical identity"}.

Conclusion

37. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Kim whose telephone number is (571) 272-2737. The examiner can normally be reached on M-F, 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christian Chase can be reached on (571) 272-4190. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Paul Kim
Patent Examiner, Art Unit 2161
TECH Center 2100


SAM RIMELL
PRIMARY EXAMINER